*Int.j.pathol.2016;14(4):142-147*

**Original Article**

# Evaluation of Surveillance System of Acute Flaccid Paralysis in Azad Jammu & Kashmir: 2011 to 2015

**[1]Dr. Syed Nadeem-ur-Rehman, [2] Dr. Uzma Hafeez and [3]Dr. Tamkeen Ghafoor**

[1]Provincial Technical Officer FELTP-Pak, Provincial Disease Surveillance & Response Unit, Directorate General Health, Muzaffarabad, AJ&K, [2]Assistant Professor, Department of Community Medicine, AJK Medical College, Muzaffarabad, AJ&K, [3]Faculty FELTP-Pakistan, National Institute of Health, Islamabad

**Abstract**

**Background:** The last case of wild polio virus transmission occurred in AJ&K in October 2000.This study was conducted to describe the characteristics of patients reported with acute flaccid paralysis and to evaluate the performance of the surveillance system during 2011-2015 using indicators recommended by the World Health Organization.

**Methods:** This retrospective study was conducted at directorate of Expanded Program on Immunization AJ&K during May 2016. Records were reviewed of children aged younger than 15 years with acute flaccid paralysis. Data analysis was performed using Microsoft Excel 2007.

**Results:** During 2011 - 2015, total 213 AFP cases, aged 01 month to 15 years were reported. 55% were boys. Those below 5 years of age accounted for 62% of cases. A neurological cause was identified in 83% of cases, of which the most common was Guillain-Barré syndrome (63%), followed by transverse myelitis (16%). None of the cases were acute poliomyelitis or polio-compatible. Majority of cases were reported by public sector health facilities (93%). All except one of the performance indicators consistently met World Health Organization requirements and thus demonstrated the effectiveness of the acute flaccid paralysis surveillance system. The acute flaccid paralysis reporting rate consistently exceeded 2.0 per 100 000 population below 15 years of age and satisfied World Health Organization requirements, however it is below national average which is 8.8.

**Conclusion:** AFP surveillance meeting WHO recommended standards has help the state of AJ&K in maintaining a polio free status for over fifteen years. High quality AFP surveillance must be sustained to achieve global eradication of polio.

**Keywords:** Surveillance, AFP in AJK, polio eradication.

## Introduction

Poliomyelitis is an infectious disease caused by the polio virus. It targets mainly children under 5 years of age and the mode of transmission is via the fecal-oral route.[1,2] . The term poliomyelitis is derived from the Greek word “polios”, meaning "grey", “myelós”, meaning “marrow”, and the suffix “itis", meaning “inflammation”. Thus poliomyelitis is inflammation of the grey matter of spinal cord. Approximately 90% of polio infections are symptomless.

In about 1% of cases, the virus invades the central nervous system and destroys the motor neuron which results in muscles weakness and acute flaccid paralysis. Clinical symptoms of poliomyelitis include high grade fever, headache neck stiffness muscle pain and asymmetrical weakness of muscles leading to paralysis in about one to ten days since onset of illness. Clinically poliomyelitis is suspected in patient having sudden onset of acute flaccid paralysis in one or more limbs with absent tendon reflexes without sensory loss. Diagnosis is confirmed by isolation of polio virus from stool sample.

The global eradication of polio is public health intervention for elimination of all the cases of this infection from the world. The World Health Organization took this global polio eradication initiative in 1988.At present, the polio endemic countries are Afghanistan and Pakistan. Total polio cases worldwide in 2015 were 74.In Pakistan, 54 new

**AUTHOR’S CORRESPONDENCE:**
**Dr. Syed Nadeem-ur-Rehman**
Provincial Technical Officer FELTP-Pak, Provincial Disease Surveillance & Response Unit, Directorate General Health, Muzaffarabad, AJ&K

cases of polio were diagnosed in 2015.[4] World Health Organization has outlined key strategies for stopping polio transmission through a combination of routine immunization, supplementary immunization campaigns and surveillance of possible outbreaks [5]

The term acute flaccid paralysis (AFP) is used to describe a sudden onset of flaccid paralysis in one or more limbs in a child aged less than15 years as might be found with poliomyelitis or other neurologic disorders namely Guillain-Barre syndrome, transverse myelitis , traumatic neuritis, meningitis, encephalitis, and brain tumors[6] .AFP cases with fever at the onset of paralysis, age less than 5 years, and asymmetrical paralysis who are unvaccinated are suspected poliomyelitis cases and should be prioritized for further investigation.[7]

Public health surveillance is the ongoing, systematic collection, analysis, interpretation, and dissemination of data regarding a health-related event for use in public health action to reduce morbidity and mortality and to improve health. The objectives of Acute Flaccid Paralysis surveillance system are detection, prompt Investigation and reporting of polio cases; dissemination of information for prompt implementation of control measures and documentation of absence of poliovirus circulation for polio-free certification. WHO has recommended following performance indicators for AFP surveillance system. [8 9] (Table 1)

**Table 1 WHO indicators of AFP surveillance system**

| Sr.No. | Performance Indicator | Target |
|---|---|---|
| **1** | Non Polio AFP rate in children ≤ 15 years | 2/100000 |
| **2** | Completeness of weekly and monthly reporting | ≥90% |
| **3** | Timeliness of weekly and monthly reporting | ≥80% |
| **4** | Reported AFP cases investigated ≤48 hours of report | ≥80% |
| **5** | Reported AFP cases with 2 stool specimens collected in ≤ days since onset | ≥80% |
| **6** | Reported AFP cases with 60 days follow up to verify residual paralysis | ≥80% |
| **7** | Specimen arriving at NIH lab ≤ 3 days of being sent | ≥90% |
| **8** | Specimen arriving at NIH lab in good condition | ≥80% |
| **9** | Specimens with turnaround time ≤ 28 days(Reporting time from Lab) | ≥80% |
| **10** | Stool Specimens from which non polio enterovirus was isolated | ≥10% |

The objectives of this study is to review the existing AFP surveillance system in Azad Jammu & Kashmir, to identify the strengths and weakness of the existing system and make recommendations for further improvement in the existing system(Figure 1)

## Material and Methods

The present study was conducted during May 2016. The principal investigator participated in a training workshop on the national and international guidelines of AFP surveillance evaluation and its performance indicators before the initiation of the present study. The investigator paid a visit to the Directorate General of Health (DGH) in AJ&K to conduct a primary meeting with the director general, the main objectives of the study were explained and the administrative approval of the director general was obtained. The evaluation process was conducted at three levels, regional (Directorate), intermediate (Districts) and local level (first level care facilities) and EPI department of Abbas Institute of Medical Sciences (AIMS) Muzaffarabad. Field visits were conducted at selected first level care facilities in district Muzaffarabad and Abbas Institute of Medical Sciences (AIMS), a tertiary care hospital of the capital city of AJ&K. Focal points personnel, active surveillance personnel, district health managers were interviewed in addition to pediatricians, public health specialists, general practitioners, medical and laboratory technicians to evaluate their knowledge about the surveillance system according to the WHO field guidelines. Furthermore, all the relevant records of the active and passive surveillance were observed and evaluated for the year 2011 to 2015. All the performance indicators were calculated and compared with the international targets based on the WHO-recommended indicators and CDCs' Updated Guidelines for evaluating Public Health surveillance Systems 2001[10].

## Results

During 2011 - 2015, total 213 AFP cases (Table 2), aged 01 month to 15 years were reported. 55% were boys. Those below 5 years of age accounted for 62% of cases (Table 3). A neurological cause was identified in 83% of cases, of which the most common was Guillain-Barré syndrome (63%), followed by transverse myelitis (16%). None of the cases were acute poliomyelitis or polio-compatible (Figure 2).Most cases were reported from districts Bimber and Bagh while least number of cases were reported from district Havali.( Figure 3) Mostly the AFP cases were seen in winter months(Figure 4). Majority of cases were reported by public sector health facilities (93%). All except one of

the performance indicators consistently met World Health Organization requirements and thus demonstrated the effectiveness of the acute flaccid paralysis surveillance system in AJ&K (Table 4) The acute flaccid paralysis reporting rate consistently exceeded 2.0 per 100 000 population below 15 years of age and satisfied World Health Organization requirements, however it is below national average which is 8.8.

**Table 2: Virological flowchart of AFP cases in AJK Year 2011-2015**

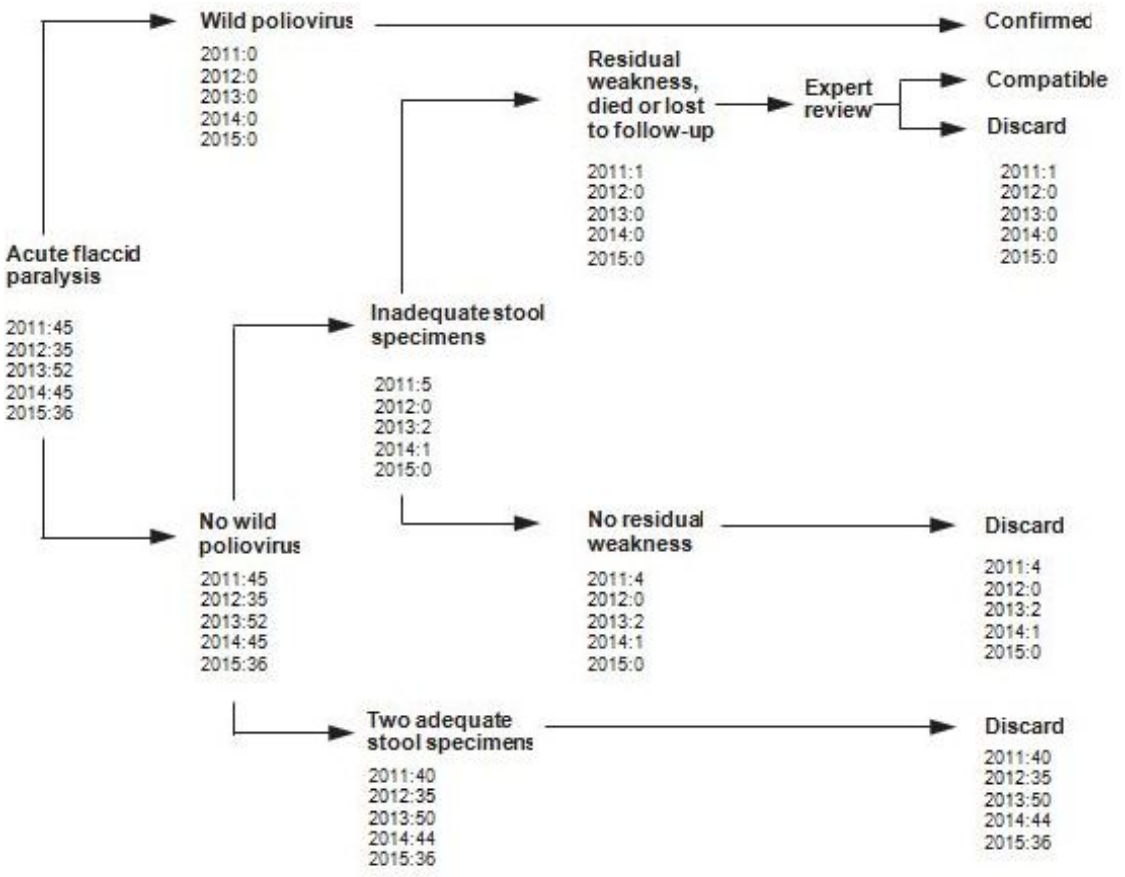


**Table 3: Age distribution of AFP cases in AJ&K 2011-2015**

| Year | Male | | | Female | | | Both | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| | <5 Years | 5 to 10 Years | >10 Years | <5 Years | 5 to 10 Years | >10 Years | <5 Years | 5 to 10 Years | >10 Years | |
| 2011 | 11 | 9 | 5 | 15 | 4 | 1 | 26 | 13 | 6 | 45 |
| 2012 | 15 | 2 | 2 | 12 | 1 | 3 | 27 | 3 | 5 | 35 |
| 2013 | 17 | 10 | 4 | 11 | 9 | 1 | 28 | 19 | 5 | 52 |
| 2014 | 9 | 10 | 2 | 17 | 5 | 2 | 26 | 15 | 4 | 45 |
| 2015 | 17 | 2 | 2 | 8 | 6 | 1 | 25 | 8 | 3 | 36 |
| **Total** | **69** | **33** | **15** | **63** | **25** | **8** | **132** | **58** | **23** | **213** |

**Table 4 Analysis of AFP surveillance system as per WHO recommended performance indicators**

| Performance Indicator | Target | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|
| Non Polio AFP rate in children ≤ 15 years | 2/100000 | 2.8 | 2.2 | 3.2 | 2.8 | 2.2 |
| Completeness of weekly and monthly reporting | 90% | 100% | 92% | 94% | 90% | 96% |
| Timeliness of weekly and monthly reporting | 80% | 100% | 100% | 100% | 100% | 100% |
| Reported AFP cases investigated ≤48 hours of report | 80% | 97.7% | 100% | 94% | 85% | 100% |
| Reported AFP cases with 2 stool specimens collected in ≤ 14days since onset | 80% | 96% | 94% | 92% | 82% | 80% |
| Reported AFP cases with 60 days follow up to verify residual paralysis | 80% | 92% | 94% | 81% | 80% | 80% |
| Specimen arriving at NIH lab ≤ 3 days of being sent | 90% | 100% | 100% | 100% | 100% | 100% |
| Specimen arriving at NIH lab in good condition | 80% | 88% | 100% | 100% | 97.8% | 100% |
| Specimens with turnaround time ≤ 28 days(Reporting time from Lab) | 80% | 100% | 100% | 100% | 100% | 100% |
| Stool Specimens from which non polio entero virus was isolated | 10% | 15.5% | 11.4% | 3.8% | 11.1% | 2.2% |

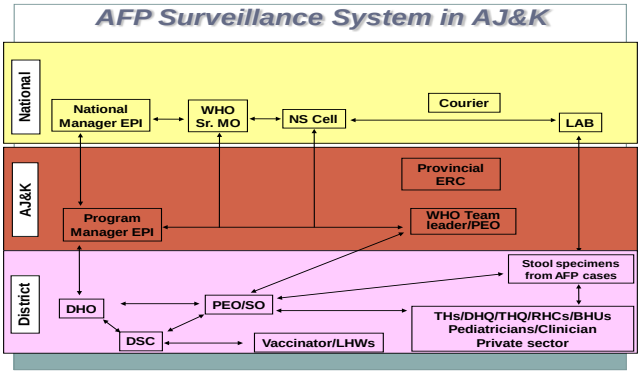


**Figure 1 AFP surveillance system in AJ&K**

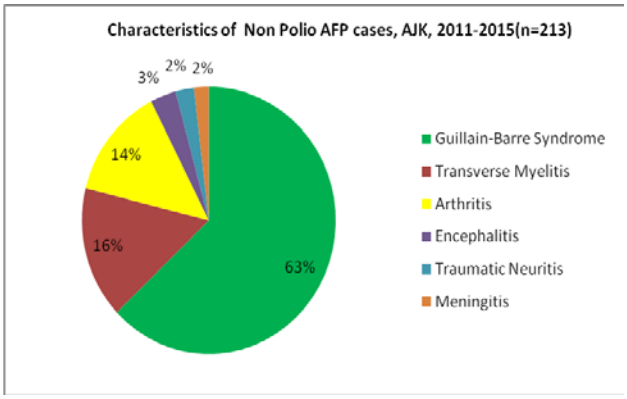


**Figure 2: Characteristics of AFP cases in AJ&K 2011-15**

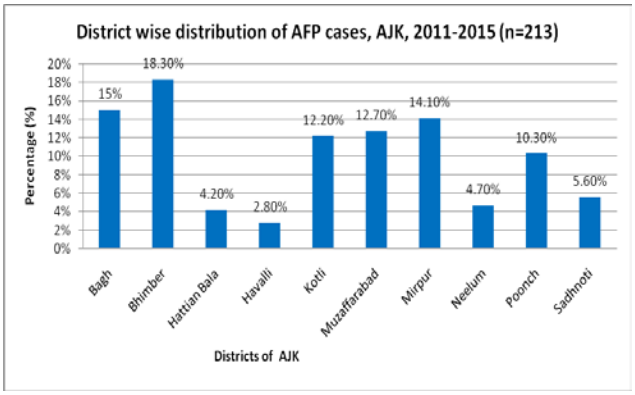


**Figure 3: District wise distributions of AFP cases in AJ&K**

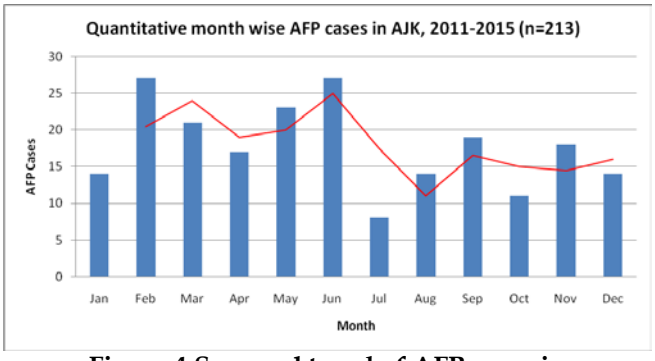


**Figure 4 Seasonal trend of AFP cases in AJ&K 2011-2015**

## Discussion

Health officials use the information obtained by the surveillance system to plan, implement, and evaluate health programs and activities[11]. In AJ&K, AFP surveillance was introduced in 1995 in order to look for wild polio virus circulation in the community through clinical, epidemiological, and laboratory investigations. For the time being AFP surveillance system is implemented in AJ&K at two levels. The first is the routine zero reporting including the immediate notification of AFP cases. The second is the active surveillance, which is a strategy to actively collect information by visiting health facilities weekly. This study showed that the structure of the AFP surveillance in AJ&K was solid with clear field guidelines[12]. On the other hand, the level of awareness among both clinicians who were working in hospitals and PHC staff was excellent, a satisfactory relationship was observed between both levels due to the frequent joint training workshops which were conducted by the DOH. In the present study all the calculated performance indicators, were excellent; all were above the international target level set by World Health Organization[13] [14] [15]. However, non polio AFP rate observed in 2011-2015 was lower than the national level observed during this period which on average is 8.6 during 2011 to 2015.This result highlighted the importance of maintaining physicians' awareness of acute flaccid paralysis surveillance.

The limitations we experienced in this study was insufficient time for stakeholders' interviews therefore selected interviews were conducted, less logistics were available, therefore selected AFP surveillance reporting sites were visited in district Muzaffarabad only. Furthermore, record of AFP Surveillance was observed only at EPI directorate, District Health Officers' office Muzaffarabad, WHO Polio Eradication Officers 'office and EPI office at Abbas Institute of Medical Sciences Muzaffarabad due to time and financial constraints.

## Conclusions

Government of Azad Jammu & Kashmir support WHO global polio eradication initiative. There is specific solid AFP surveillance system in Azad Jammu &Kashmir. The staff is well trained and there are clear guide lines according to the World Health Organizations' standards.AFP surveillance in AJ&K meets World Health Organization requirements. No polio case in AJ&K during 2011-2015; however, importation/reintroduction of polio virus from adjacent areas of Punjab and Khyber Pakhtunkhwa is a constant threat.

## Recommendations

Additional staff training is needed to update their knowledge and motivation. It is critical to continue & sustain AFP Surveillance till the goal of global eradication of polio is achieved. There is need for conducting another comprehensive evaluation in the future.

## Acknowledgements


- Faculty AJ&K Medical College Muzaffarabad
- Faculty FELTP-Pakistan
- Director General Health Azad Jammu &Kashmir
- Executive Director AIMS Muzaffarabad
- Provincial Program Manager EPI ,Muzaffarabad
- District Health Officer Muzaffarabad
- Polio Eradication Officer WHO Muzaffarabad
- Pediatrician AIMS Muzaffarabad
- Medical Officer RHC Upper chatter Muzaffarabad
- District Superintendent Vaccination Muzaffarabad
- Vaccinator EPI AIMS Muzaffarabad


## References


1. Heymann DL. Control of communicable diseases manual. 18th ed. Washington, DC: American Public Health Association; 2004.
2. Mandell GL, Bennett JE, Dolin R, editors. Principles and practice of infectious diseases. 5th ed. New York: Churchill Livingstone; 2000.
3. Hertzberger LI, Huisman J, Wilterdink JB. The global eradication of polio by the year 2000. Ned Tijdschr Geneeskd 1998; 142: 972-973.
4. World Health Organization .Global Polio Eradication Initiative 2016
5. 5. World Health Organization. Global eradication of poliomyelitis, re¬port of the technical consultation, 29-30 April 1996. Geneva: Global Programme for Vaccines and Immunization, Expanded Programme on Immunization, WHO; 1997. p. 5-7.
6. Robertson S; Expanded Program on Immunization. The immuno¬logical basis for immunization series, module 6: poliomyelitis. Ge¬neva: Global Program for Vaccines and Immunization, Expanded Program on Immunization, WHO; 1996. p. 1-2.
7. World Health Organization. Global eradication of poliomyelitis: re¬port of the sixth meeting of the Global Technical Consultative Group for Poliomyelitis Eradication, Geneva, 7-10 May 200. Geneva: Dept. of Vaccines and Biologicals, WHO; 2001.

8. World Health Organization. Global eradication of poliomyelitis, re¬port of the second meeting of the global technical consultative group (TCG), 28 April 1997. Geneva: Global Program for Vaccines and Immunization, Expanded Program on Immunization, WHO; 1998. p. 10-17.
9. World Health Organization. Guidelines for preparedness and response for wild poliovirus importation and format for national plans.
10. Updated guidelines for evaluating public health surveillance systems. Recommendations from the Guidelines Working Group. Centers for Disease Control and Prevention website: http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5013a1.htm Accessed 10 May 2016.
11. Odoom JK, Ntim NA, Sarkodie B, Addo J, Minta-Asare K, Obodai E et al. Evaluation of AFP surveillance indicators in polio-free Ghana, 2009-2013. BMC Public Health. 2014 Jul 5; 14:687
12. Kufakwanguzvarova Pomerai, Robert F Mudyiradima, Mfuta Tshimanga, and Mary Muchekeza. Evaluation of the Acute Flacid Paralysis (AFP) Surveillance System in Bikita District Masvingo Province 2010. BMC Res Notes. 2014; 7: 252.
13. Macama A, Okeibunor J, Grando S, Djibaoui K, Yameogo RK, Morais A et al. Reasons and circumstances for the late notification of Acute Flaccid Paralysis (AFP) cases in health facilities in Luanda. Pan Afr Med J. 2014 Jul 23;18:239.
14. Nasir SG, Aliyu G, Ya'u I, Gadanya M, Mohammad M, Zubair M et al. From intense rejection to advocacy: how Muslim clerics were engaged in a polio eradication initiative in Northern Nigeria. PLoS Med. 2014 Aug 5; 11(8):e1001687.
15. Bassey BE, Gasasira A, Mitula P, Frankson UU, Adeniji JA. Surveillance of acute flaccid paralysis in Akwa Ibom State, Nigeria 2004-2009. Pan Afr Med J. 2011;9:32.



| .HISTORY | |
|---|---|
| Date Received: | 5-DEC-2016 |
| Date Sent for Reviewer: | 15-DEC-2016 |
| Date Received Reviewers' Comments: | 7-JAN-2017 |
| Date Received Revised Manuscript: | 20-JAN-2017 |
| Date Accepted: | 25-JAN-2017 |

| CONTRIBUTION OF AUTHORS | |
|---|---|
| **Author** | **CONTRIBUTION** |
| Dr. Syed Nadeem-ur-Rehman | A – B – C – D |
| Dr. Uzma Hafeez | B – C – D – E |
| Dr. Tamkeen Ghafoor | C – E – F |

**KEY FOR CONTRIBUTION OF AUTHORS:**

A. Conception/Study Designing/Planning
B. Experimentation/Study Conduction
C. Analysis/Interpretation/Discussion
D. Manuscript Writing
E. Critical Review
F. Facilitated for Reagents/Material/Analysis